# Antibacterial Activity of Hybanthus travancoricus (Bedd.) Melch.

Vimala C[1], Maybel Starlin N[2], Irene Wilsy J[3], Reginald Appavoo M[4]
[1]*Research Scholar, Department of Botany and Research Centre, Scott Christian College (Autonomus) Nagercoil, Kanyakumari District -629003, Tamil Nadu, India*
[2]*Associate Professors, Department of Botany and Research Centre, NMCC College, Marthandam, Kanyakumari District -629003, Tamil Nadu, India*
[3]*Associate Professors, Department of Botany and Research Centre, Scott Christian College (Autonomus) Nagercoil, Kanyakumari District -629003, Tamil Nadu, India*
[4]*Associate Professors, Department of Botany and Research Centre, Scott Christian College (Autonomus) Nagercoil, Kanyakumari District -629003, Tamil Nadu, India*
*(Affliated to Manonmanium Sundaranar University, Tirunelveli)*

***Abstract*** **- Hybanthus travancoricus (Bedd.) Melch. belonging to family Violaceae, was investigated to evaluate in vitro antibacterial activity of aqueous, petroleum ether and acetone extracts against Escherichia coli, Staphylococcus aureus, Proteus mirabilis, Klebsiella pneumoniae and Pseudomonas aeruginosa by disc diffusion method. The maximum zone of inhibition was observed in Proteus mirbilis and Pseudomonas aeruginosa in Acetone extract and the minimum zone of inhibition was observed in Staphylococcus aureus in Petroleum ether extract.**

***Index Terms*** **- Antibacterial activity, Hybanthus travancoricus, Pathogens.**

## I.INTRODUCTION

Hybanthus is a herbal plant used for medicinal purpose. It is also called as “hump back flower" and they are also called as green violet (L) F.muell. It is a genus of perennial often creeping whose leaves are alternate or in clusters. It consists of 150 species found in tropical and subtropical regions of the world often seen in mountainous region. Its medicinal property is due to the presence of physiological and pharmacological activity. It is often woody also found in warmer part of India [1].

Medicinal plants play a major role in healthcare and they are recognised by WHO as a key factor in world health. They exhibit a wide range of therapeutic properties. Several medicinal plants are available especially in developing and underdeveloped countries, which are used by the rural individuals [5]. The plant is used as an aphrodisiac, demulcent, tonic, diuretic, anti-convulsant and antimalarial and used to treat urinary infections, diarrhoea, leucorrhoea, dysuria, inflammation and male sterility [7]. The plant is used to treat ailments such as, urinary calculi, painful dysentery, vomiting, burning sensation, blood troubles, asthma, epilepsy and breast tone [2].

In the present study, the antibacterial activity of Hybanthus travancoricus against the bacterial pathogens using solvent extracts petroleum ether, acetone and aqueous. The selected pathogens were E.coli, Staphylococcus aureus, Proteus mirabilis, Klebsiella pneumoniae and Pseudomonas aeruginosa.

## II.MATERIALS AND METHODS

### Sample collection and solvent extraction

Fresh plant of Hybanthus travancoricus was collected from Malaimari, Edaicode, Kanyakumari District, Tamil Nadu. The plants were dried under shade condition for one month and stored in sterile containers for further use. A soxhlet apparatus was used for extraction, with Acetone, Petroleum ether and Aqueous solvents.

### Bacterial strains

In the present study five human pathogenic pathogens were used namely Ecoli (MTCC 1687), Staphylococcus aureus (MTCC 737), Pseudomonas

aeruginosa (MTCC 1688), Klebsiella pneumonia (MTCC 7162) and Proteus mirbilis (MTCC 3310) obtained from MTCC, Chandigarh. Stock culture were maintained in nutrient agar medium at $40^0$c, then subcultured in nutrient broth at $37^0$c prior to each microbial test.

Disc diffusion method

The disc diffusion method was used to screen the antibacterial activity [3]. The sensitivity test of the chloroform, N-butanol and aqueous extract were determined using agar – disc diffusion method. Media were prepared using Muller Hinton Agar poured in petridishes and inoculated with test organisms from the broth using cotton swabs. Disc impregnated with the plant extract were placed on the swabbed plate. The plates were incubated overnight at $37^0$c for 24 hours. Amikacin was used as positive reference standard. After incubation, the clear zone around the disc were measured and expressed in mm as a measure of their antibacterial activity.

## III.RESULTS AND DISCUSSION

The result on antibacterial activity of Hybanthus travancoricus using different solvent extracts. The acetone extract showed highest zone of inhibition against the pathogen Pseudomonas aeruginosa (16mm), Klebsiella pneumoniae (14mm), Staphylococcus aureus (13mm) and Proteus mirabilis (16mm) lowest zone of inhibition against the pathogen E.coli (12mm).

The Petroleum ether extract of Hybanthus travancoricus showed maximum activity against the pathogen Proteus mirabilis (14mm), Pseudomonas aeruginosa (12mm), E.coli (10mm), Klebsiella pneumonia (8mm) and minimum activity was showed against the pathogen Staphylococcus aureus (7mm).

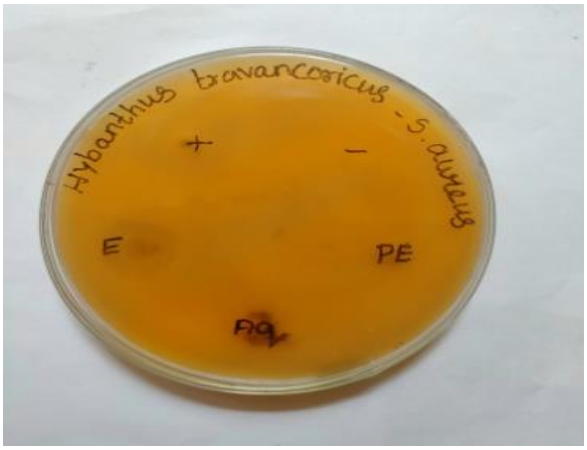
The aqueous extract of Hybanthus travancoricus showed the zone of inhibition against the pathogen Proteus mirabilis (10mm), E.coli (14mm) and Staphylococcus aureus (11mm) and minimum activity was against the pathogen Pseudomonas aeruginosa (8mm), Klebsiella pneumoniae (8mm), against the aqueous extract. All three solvent extracts of Hybanthus travancoricus showed the maximum zone of inhibition in Proteus mirbilis and Pseudomonas aeruginosa in acetone extract. The minimum zone of inhibition was observed in Staphylococcus aureus in Petroleum ether extract.

Hemalatha, et al., (2003) reported that folklore Hybanthus species used in case of pregnant and parturient women, for gonorrhoea and urinary infections. This plant extract was tested for its antibacterial activity against selected E.faecalis of urinary tract, which showed significant effect in ethanol form and moderate effect in aqueous form Sahoo, et al.,(2006).

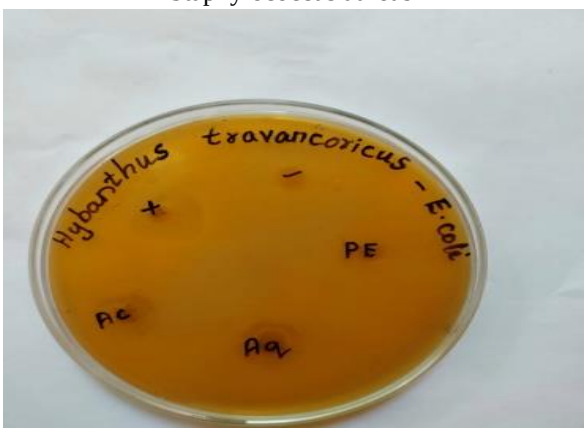
Table:1 Antibacterial activity of Hybanthus travancoricus against bacterial pathogens

| No | Bacterial Pathogens | Zone of Inhibition (mm) | | | |
|---|---|---|---|---|---|
| | | Amikacin | Acetone | Petroleum ether | Aqueous |
| 1 | E.coli | 22mm | 12mm | 10mm | 14mm |
| 2 | Staphylococcus aureus | 16mm | 13mm | 7mm | 11mm |
| 3 | Proteus mirabilis | 18mm | 16mm | 14mm | 10mm |
| 4 | Klebsiella pneumoniae | 19mm | 14mm | 8mm | 8mm |
| 5 | Pseudomonas aeruginosa | 23mm | 16mm | 12mm | 8mm |

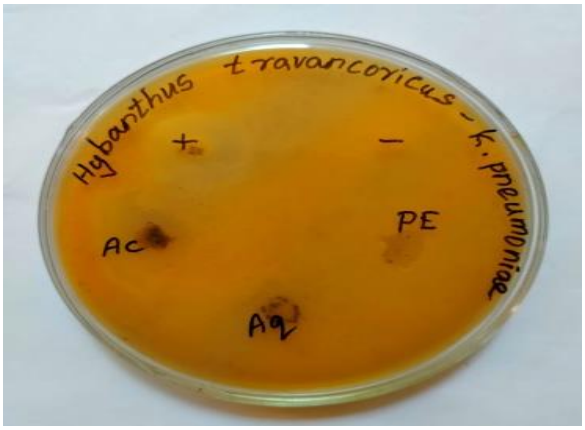
Plate1:Inhibition Zone in Hybanthus travancoricus using different solvent Disc Diffusion Method.



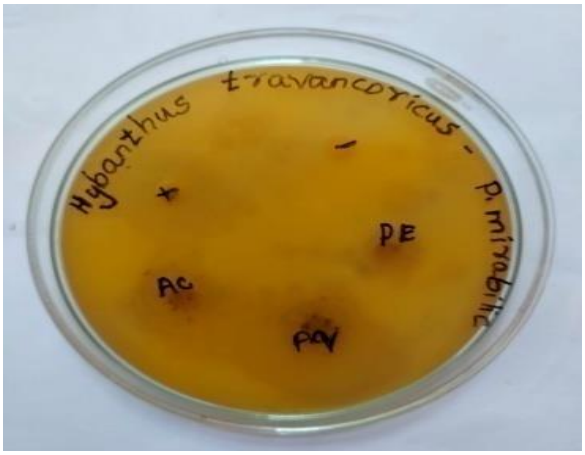

Staphylococcus aureus



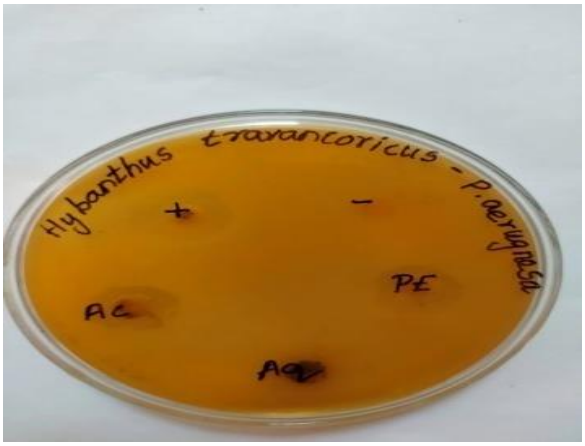

E.coli




Klebsiella pneumonia




Proteus mirabilis




Pseudomonas aeruginosa

## IV. CONCLUSION

In the present work the antibacterial activity of Hybanthus travancoricus against bacterial pathogens. Showed that the acetone extract was used as antibacterial activity as a therapeutic drug for mankind.

## V. ACKNOWLEDGEMENT

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## REFERENCES

[1] Amutha Priya,D. Ranganayaki,S. and Suganya Devi,P. (2011) Phytochemical screening and antioxidant potential of Hybanthus enneaspermus: A rare Ethano botanical herb Journal of Pharmacy Research,4(5),1497-1502.

[2] Awobajo F.O., Olatunji-Bello, I.I., Adegoke, O.A. and Odugbemi T.O. (2009) Phytochemical and antimicrobial screening of Hybanthus enneaspermus and Paquetina nigricense. Recent Res Sci Tech; 1(4):159-160.

[3] Bauer, A.W., Kirby, W.M.M., Sherris J.C. and Turck, M. (1966). Antibiotic Susceptibility testing by a standardized single disk method. Am., J. Clin. Pathol., 45: 493-496.

[4] Hemlatha, S. Wahi,A.K., Singh, P.N . and Chansouria, J.P.N. (2003) "Anticonvulsant and free radical scavenging activity of Hybanthus enneaspermus: A preliminary screening," Indian J. = Traditional Knowledge, 2 (4), 383-8, Oct.

[5] Rajsekhar,P.B., Arvind Bharani,R.S., Jini Angel,K. Maya Ramachandran and Sharadha Priya Vardhini Rajsekhar.(2016). Hybanthus enneaspermus (L) F. Muell: A phytopharmacological review on herbal medicine, Journal of Chemical and Pharmaceutical Research, 8(1):351-355.

[6] Sahoo, S. Kar, D.M., Mohapatra, S. Rout, S.P. and Dash, S.K. (2006). "Antibacterial activity of Hybanthus enneaspermus against selected urinary tract pathogens" Indian J Pharm Sci, 68, 653-5,

[7] Wahlert, G.A., Marcussen, T., Paula-Souza, J. Min Fen g and Ballard, H.E. (2014) A Phylogeny of the Violaceae (Malpighiales) Inferred from Plastid DNA Sequences: Implications for Generic Diversity and Intrafamilial Classification. Systematic Botany; 39 (1): 239-252.